

NatureServe Vista

**FY2007 WORKPLAN:
Delineating Ecological Systems and Advancing
Decision Support Tools for Land Use Planning**

**from
NatureServe**

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Purpose and Scope

This work plan describes all activities remaining to be completed under the project "Delineating Ecological Systems for Advancing Decision Support Tools For Land Use Planning," developed in response to the NASA Research, Education and Applications Solutions Network (REASoN) Cooperative Agreement Notice (CAN-02-OES-01).

Completed Activities

Installation of Vista R1.0

In May 2005, NatureServe completed development of a NatureServe Vista 1.0 project database for the Bridger-Teton National Forest (BTNF), the federal partner which will perform the required benchmark evaluation of the project's deliverables (in this case, NatureServe Vista 2.0). This process allowed NatureServe to demonstrate Vista's capabilities to BTNF. It also provided Forest Service planners an opportunity to evaluate potential roles for NatureServe Vista in their planning process, to provide feedback on NatureServe Vista, and to identify the desired changes and improvements required for their application.

Requirements Definition for Phase 1 of Software Development

By the summer of 2004, a number of potential software enhancements had been identified to support forest planning needs. The desirability and relative priority of these enhancements were confirmed in a July, 2004 workshop held with forest planners. Immediately following this workshop, NatureServe's engineering team began working on development of BTNF's high-priority functions.

Many of these high-priority functions were implemented in NatureServe Vista 1.3, which was made available on March 1, 2006. The functionality included in R1.3 is:

Function	Description
Element Value Layers	Improved importation of spatial and tabular information for conservation elements and support capture of expert knowledge regarding element conservation requirements.
Conservation Value Summaries	Improved integration of sets of elements into raster indices of conservation value.
Scenario Import and Evaluation	Improved importation and evaluation of scenarios of current and proposed land use and management, and important phenomena such as predicted wildfire, invasive species models, and urban growth models.
Site Explorer	Allows users to select individual management units, change their intended land-use/management intent, evaluate the impact of such change, and accept or reject the change.
Support for analyses of sub-regions within the planning area	Allows analyses to be attributed with a layer describing a user-defined boundary that lets the user to focus on a specific subset of the planning area.

Function	Description
Editing of land use/land management practices and protection policy lists	Allows users to directly customize the "land use" and "policy type" lists that describe the relevant land uses, land management practices and protection policies for a given location.
Conservation Scenario Generation	Allows the client to interoperate with two important conservation tools, MARXAN & SPOT. Vista 1.3 facilitates the formatting and exportation of element distribution data to these tools and the importation of resulting conservation scenarios back into Vista for scenario evaluation.
Ongoing testing and bug-fixing of current functions	NatureServe Vista version 1.3 is a robust software tool. It has undergone extensive quality assurance and beta testing to ensure a high-quality product.

To date, NatureServe Vista 1.3 has been delivered to 149 customers through NatureServe's 60-day free trial offer. NGO's, universities, consulting firms, and state governments, including NatureServe member network programs, have exhibited the highest levels of interest in the tool. A number of these customers are considering purchases of a full software license. The Lake Erie Allegheny Region Partnership for Biodiversity, a three state effort to develop a biodiversity conservation plan for the Lake Erie watershed of Ohio, Pennsylvania, and New York has chosen NatureServe Vista to help design and implement their regional biodiversity plan. Arkansas State Highways Department is currently developing a NatureServe Vista pilot project which if successful, will be offered as a service to all Metropolitan Planning Organizations within the state. These opportunities, and others like them, indicate that NatureServe Vista is gaining exposure and acceptance within the conservation community.

Requirements Definition for Phase 2 of Software Development

Additional functions for NatureServe Vista 2.0 have been identified through a series of ongoing meetings with the Forest Service and other land managers and planners. Final prioritization of these functional requirements was completed during a workshop with BTNF forest planners in May, 2006. Based on the final prioritization of functions, NatureServe identified specific software enhancements that could be completed within the grant time and resource constraints. Through this work, NatureServe has identified the following additional features to be incorporated into R2.0:

Function	Description
Support for coincident land use activities	NatureServe plans to allow for multiple land use/land management practices and protection policies to be applied to a single location with version 2.0. For instance, this will allow users to associate invasive species, grazing activities, and low-density housing with the same site.
Element Response as Condition Change	Element response to land use activity will be enhanced from current "compatible/incompatible" dichotomy to a richer model that allows planners to understand the change in condition of the occurrence.

Function	Description
Calculating Landscape Condition	When viability/integrity data for an element is not available from on-the-ground assessments, this tool will automate the production of viability/integrity layers for elements based on disturbances (e.g. roads, pollutions sources, and invasive species).
Sub-Regional Goals and Roll-Up	Forest planning requires working within management units that have specific stakeholder and forest health goals that nest within forest-wide and regional goals. This function will allow assignment of planning area (forest) goals to subregions (management units) to facilitate bottom up planning and top down evaluation.
Site Explorer (Change Land Use Type within Site)	This feature enhancement will allow users to change specific land uses within a site rather than for the entire site.
Site Explorer (Document Land Use Decisions)	This feature enhancement will allow users to document for each site which elements you are managing for (should you make a land use change) and any other notes or guidelines relevant to the land use you are proposing for that site(s).
Group Compatibility Listing	This function will increase the efficiency of capturing expert knowledge through assignment of element response to land use/management practices as groups or categories rather than individually.
Element Conservation Layer (Viewing Quality and Confidence Information)	This feature enhancement will allow users to view quality and confidence maps separately or joined.

Ongoing Activities

Methodology Prototyping

NatureServe's conservation methodology team is working closely with the engineering team to refine the requirements for all NatureServe Vista 2.0 functionality. NatureServe's GIS Ecologist/Analyst is currently prototyping each of the new features listed above. The necessary prototyping will be completed by October 2006.

To support the methodology prototyping effort, a NatureServe Vista 1.3 database has been completed for the Wyoming portion of the Greater Yellowstone Area, the BTNF, and for the Middle Grey's watershed. This includes a new Landsat TM-based forest cover map currently being piloted for the BTNF in the Middle Grey's watershed. A map of terrestrial and aquatic ecological systems has been compiled to provide the necessary spatial representation of conservation value, landscape integrity and connectivity. Mapped observations and distributions of target species and biological communities were brought into the database, along with maps of current land use and ownership. In addition, imagery analysis provided most of the information required for assessment of landscape integrity factors and to differentiate the quality of element occurrences across this landscape. The current forest management plan was incorporated as a policy scenario for evaluation to identify areas requiring changes in suitable land uses.

Software Engineering

Software engineering for version 2.0 will begin in October, 2006. The software engineering team is currently working with the conservation methodology team to refine feature requirements and to develop appropriate implementation strategies for each function. Detailed engineering on version 2.0 features will follow successful methodology prototyping.

It is currently anticipated that NatureServe will hold a workshop with BTNF forest planners in early December, 2006 to demonstrate and explore an “Alpha” version of the version 2.0 software. A “Beta” version, which will be used to perform benchmark testing in the Middle Grey’s watershed, will be available in January, 2007.

Quality Assurance Testing

Quality assurance (QA) testing will begin in November, 2006 with the creation of detailed test plans for each of the version 2.0 features. Testing will be phased in over the course of November and December 2006, as new features are made available to the testing team. QA testing for all new features will be completed prior to the delivery of a “Beta” version of the software to BTNF in January, 2007.

Documentation and Training

Note: it is not anticipated that NASA funds will be used to support this activity

The development of documentation and training for each of the version 2.0 features will begin in November 2006, coincident with development of the “Alpha” software version. Drafts of the documentation and training will be in place by January 2007, allowing NatureServe to “test” these deliverables in conjunction with benchmark testing of the version 2.0 software.

Benchmark Testing

Consistent with their forest planning process, BTNF forest planners have expressed a desire to conduct benchmark testing of NatureServe Vista on a discrete management unit within the forest. Since benchmark testing of the entire forest, for data availability reasons, could not begin until summer 2007, this will also allow for an earlier completion of the benchmark test. For these reasons, the Middle Grey’s watershed management unit has been selected for the benchmark test. Data for this management area is already available and, according to BTNF’s most recent schedule, they will be prepared to initiate benchmark testing of this management unit in January, 2007. We anticipate that benchmark testing of the Middle Grey’s will be completed in February, 2007 and that the benchmark report will be available by mid-March, 2007.

Final QA Testing, Support Services, and Product Marketing

Note: it is not anticipated that NASA funds will be used to support this activity

A final round of QA testing will be initiated approximately one month after the start of benchmark testing. Concurrent with this testing effort, a number of other activities will be undertaken to support the general release of NatureServe Vista 2.0. These include: completion of product documentation and training, development of an updated knowledge base, creation of demonstration datasets, and development of updated marketing materials and release announcements. We anticipate that these final activities will be completed in time to support a mid-April, 2007 release of NatureServe Vista 2.0.

Schedule

